IN THE AIR

By Neil Harrison: Number 215 of the series

ALPAVIA FOURNIER RF-3

(One Rectimo AR 1200 VW of 39 h.p. driving a fixed-pitch Hoffman wooden propeller)

Span, 37.1ft; length, 19.7ft; height, 5.15ft; wing area, 120.3 sq ft; fuel capacity, 6½ Imp gal; empty weight, 530lb; gross weight, 770lb; wing loading, 6.4lb/sq ft; power loading, 19.75lb/h.p.

Performance Take-off distance to 50ft, 875ft; sea level rate of climb, 750ft/min; observed cruising speed, 112 m.p.h. true at 90 per cent max continuous r.p.m.; range, 340 miles on standard tanks no reserve.

FOURNIER RF-3

AT LONG LAST there are signs that the Fournier *avion planeur* is to be put into serious production in improved single-seat and two-seat versions. M Fournier is now working with a new Franco-German company, Sportavia, which has been set up by Herr Alfons Pützer in Dahlem-Eifel in Germany, where the local authorities are subsidising the establishment of a new factory.

The improved version of the 11 metre single-seater, the RF-4, is just entering production while the 16 metre RF-5 two-seater powered by a 60 h.p. Volkswagen engine will fly next April for delivery to customers early in 1968. Sportavia plans to employ around 70 workers and to produce up to ten aircraft per month. Now getting ready to handle the range in Britain is a new company called Sportair Aviation Ltd, based at Luton and directed by Wg Cdr Sir Henry Dalrymple-White and Mr David Campbell.

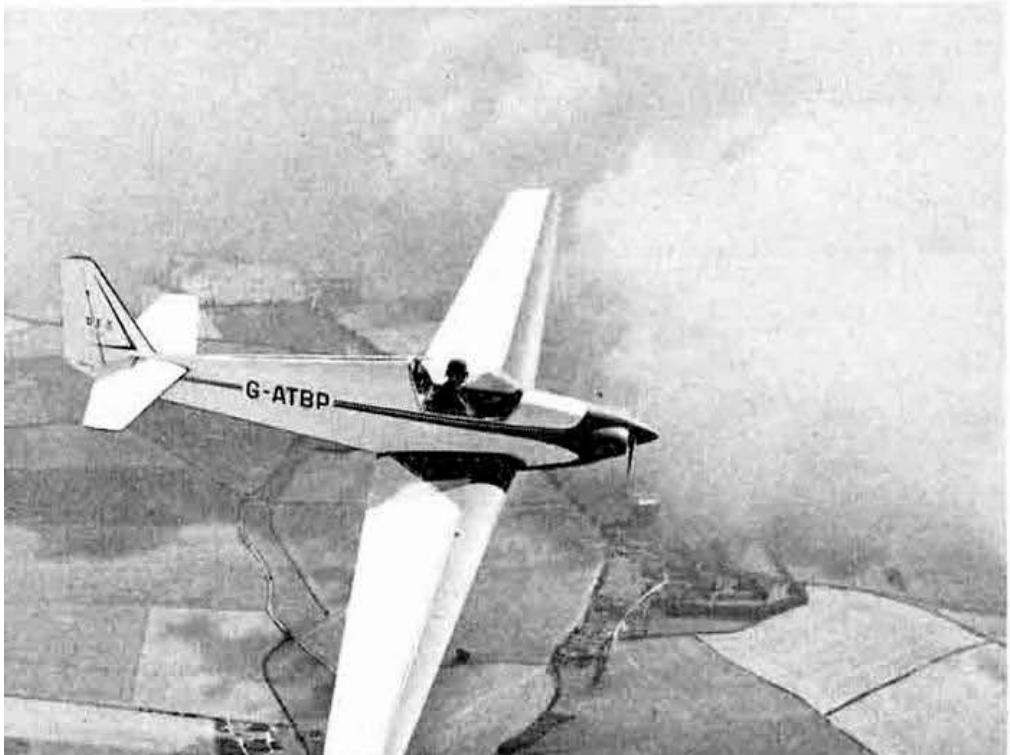
Perhaps because the Fournier has always been regarded as a powered sailplane there has been a tendency to overlook its extremely high efficiency as a touring aircraft. Sportair Aviation hopes to emphasise both aspects by presenting the improved aircraft (particularly the two-seater) as an outstanding solution to the problem of the rising cost of flying training and private flying generally while at the same time offering an extremely good performance. The price for the two-seater has yet to be fixed (it will be around £3,000), but the RF-4 will sell for under £2,300 delivered in Britain with all duty paid. As an indication of the possibilities it may be noted that Sportair hires-out the RF-3 for under £3 an hour.

At the invitation of Sportair I recently became acquainted with the RF-3, some 95 of which were built by Alpavia at Gap in Southern France before production ceased earlier this year. Although considered aerobatic by French airworthiness standards, it is in fact stressed to only +4.5g with a 1.5 reserve factor and there have been instances of structural failure during aerobatic flight. The RF-4 has stronger spar booms and a closer wing rib spacing to qualify it for unrestricted aerobatics. A sample of the all-wooden airframe has been static tested. Other improvements in the RF-4 include aerodynamically balanced ailerons, a coil-spring starter, and wider use of glass fibre in non-structural components.

The RF-3 has a full ARB C of A for hire-and-reward flying, even though the 39 h.p. Rectimo AR1200 Volkswagen engine has only a single ignition system. The concession was allowed in view of the fact that the aircraft can put down virtually anywhere, just like a pure sailplane. For the purpose of this report the RF-3 is considered first as an ultra-light single-seater for touring; in the concluding section Mr Derek Piggott discusses its qualities as a sailplane.

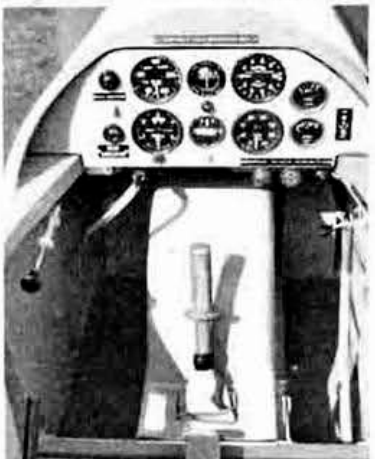
With an empty weight of 530lb the aircraft can carry full fuel and a 13st 11lb pilot or a lighter pilot and up to 20lb of baggage. The classic approach to efficiency of having a low wing-loading and a high aspect-ratio allied to a clean shape works most effectively in this case to produce an incredibly high cruising speed of around 110 m.p.h. from a mere 39 h.p. At a cruising r.p.m. of 3,200 the engine consumes some 2.1 Imp gal/hr to give a still-air range of 340 miles on a full tank.

As ultra-lights go it is also a most civilised aeroplane for touring: there is none of the usual hammering vibration, whistling draughts or cramped surroundings. The semi-reclined



(Left) "The classic approach to efficiency . . . a low wing-loading, a high aspect ratio, and a clean shape"

(Below) RF-3 cockpit: the undercarriage retraction lever and locking catch are on the right and air brake lever on the left (forward for closed); valve lifter for airborne engine starting, fuel cock, and carburetter choke are the three control knobs on the right below the panel "Flight" photographs



FOURNIER RF-3 in the Air . . .

"The unconventional bicycle undercarriage arrangement, with a retractable mainwheel and wire outriggers with tiny plastic wheels attached, works surprisingly well" "Flight" photograph

seating position should suit the tallest of pilots (cushions are used to vary the reach). The beautifully smooth canopy is clamped down firmly by an over-centre catch while the fuel tank and the retracted single-wheel undercarriage help to isolate engine noises and vibration. One might expect that, with a low wing-loading, a highish aspect ratio and a seemingly stiff wing, the aircraft would be thrown about in turbulence; but in fact it behaved extremely well in a highly unstable 20kt (gusting 35kt) airstream on the day of the test flight.

On G-ATBP, the fifty-ninth RF-3 built by Alpavia, the tiny flat-four air cooled engine had to be hand swung, but it started second flick. The unconventional bicycle undercarriage arrangement (with a retractable mainwheel and wire outriggers with tiny plastic wheels attached) works surprisingly well. The tailwheel is steerable and the handbrake works on the mainwheel. Being very low to the ground the aircraft can be taxied without manual assistance at the wing-tips, even with a strong wind blowing.

Take-off checks are simple: friction adjusted on the plunger throttle; elevator trim lever in the take-off range; fuel on; air brakes retracted; canopy clamped; engine oil temperature and pressure indications OK. There is, of course, no magneto check. Initial acceleration is sluggish but the tail soon comes off and the rest of the run is on the single mainwheel. Unstick occurred at about 70 k.p.h. indicated (44 m.p.h.) and the climb-out was made at the recommended speed of 110km/hr indicated (68 m.p.h.).

Many pilots, including the designer, have demonstrated how the RF-3 can be made to perform beautifully graceful aerobatics; but for structural reasons the ARB C of A prohibits aerobatics. Although rather heavy ailerons and a sluggish response are likely to prevent things coming undone due to excessive manœuvring in the rolling plane the aircraft is highly responsive in pitch and the elevator is very light. In quite a shallow dive the clean RF-3 would soon exceed its maximum permitted speed of 210km/hr (130 m.p.h.); but, if one is content just to go places in normal flight and to putter around playing at sailplanes, the RF-3 has nicely appropriate hands-off stability.

With so low a wing loading there is no need for flaps. The approach angle is made steep and the lift is killed at the flare by means of top-surface airbrakes. These should only be extended below 150km/hr (93 m.p.h.)—a speed well below cruising; they are not intended as dive brakes. Power-off stalling occurs at 70km/hr indicated (44 m.p.h.), the nose dropping but the wings staying level. Extending the air brakes does not affect the trim but the stalling speed goes up by 5km/hr (3 m.p.h.)—there is no nose drop, just a high rate of sink and a slight buffeting.

Raising or lowering the mainwheel is a two-action routine. First, the up- or down-lock (according to which position the leg happens to be in) is released by moving a small lever which is itself protected by a finger-release catch; then a directly connected lever is pushed forward to lower the leg, or back to lie beside the seat in the retracted position. The first-mentioned lever snaps back when the leg is once more locked. Considering the simplicity of the system, the action is reasonably easy and positive. A warning buzzer bleats if the throttle is closed with the gear up. Because of the power of the low-speed air brakes it is recommended that one should have the surfaces either in or out from a reasonable height on the approach. With the brakes out, quite a lot of power is needed to maintain a 95km/hr (62 m.p.h.) approach speed. The touchdown technique is just as for a normal tailwheeler.

INSTANT SOARING WITH THE RF-3

The Fournier RF-3 offers the soaring enthusiast some exciting new possibilities. At the Lasham Gliding Centre a number of experienced instructors tried out this attractive little aeroplane to see whether it has a place in gliding clubs. Everyone agrees that it is the most exciting and most versatile light aircraft they have flown.

The handling at low speeds is very similar to that of modern gliders and, by carefully adjusting the throttle to speed up the tick-over, the appropriate gliding performance can be easily simulated.

This is more practical than stopping the engine altogether. The true glide of about 18:1 at about 60 m.p.h. is fair enough for climbing in good thermals, though greatly inferior to that of even training gliders. Also, re-starting the engine of the aircraft tested involved a dive of some 600ft, but perhaps as it becomes thoroughly run in the process will be easier. At present it is really safe only in smooth air and the decision has to be taken much too early to allow hill soaring or the use of thermals below about 1,500ft.

The Fournier and similar machines can, however, offer very useful experience to the pilot hoping to learn how to make use of thermals or other forms of up-current. Even on a day with very weak or scattered thermals, valuable practice (and great fun) can be had by flying the RF-3 with a very low power-setting so that, by careful centering and accurate flying, a gradual gain of height becomes possible. At these low settings the aircraft is so quiet that from the ground it is difficult to tell that the engine is still running. (1,600 r.p.m. was found to give the same rate of descent as on a modern glider, at which power the fuel consumption is about half a gallon per hour.)

Flying in this way, the experienced soaring pilot can practice glider cross-country flying with all the complications of speed-to-fly computers and final-glide calculations but without risking the nuisance of a possible landing in a field, and without having to wait for a really good soaring day.

Perhaps this will prove an answer to training a British team to win the next World Gliding Championships. It would solve many of the problems of practising the team flying techniques which seem to have enabled the Polish team to win so decisively last year.

DEREK PIGGOTT

"The experienced soaring pilot can practise cross-country flying . . . without having to wait for a really good day" "Flight" photograph